

REMARKS

The Office Action mailed July 2, 2003, has been carefully reviewed and Applicants note with appreciation the identification of allowable subject matter.

By this Amendment, claims 84, 85, 98, 100, 110, 118, 125, 127 and 137 have been canceled, claims 83, 86, 87, 89, 92, 94-96, 99, 101, 102, 106, 111-115, 117, 126, 128, 129, 138, 139 have been amended, and new claims 141-151 have been added. Claims 83, 86-97, 99, 101-109, 111-117, 119-124, 126, 128-136 and 138-151 are pending in the application.

The Examiner rejected claims 88, 92-97, 111, 112, 138, and 139 under 35 U.S.C. 112, second paragraph, as being indefinite. By this Amendment, Applicant has corrected the informalities noted, as well as others identified upon review.

The Examiner rejected claims 83-85, 106, 113, 114, 117-119 and 133 under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 6,108,369 to Ovesjo et al. ("Ovesjo"). Under 35 U.S.C. 103(a), the Examiner rejected claims 86, 98-101, 110, 120, 121, 125-128 and 140 as being unpatentable over Ovesjo in view of U.S. Patent No. 6,519,278 to Hiramatsu, and rejected claims 102 and 129 as being unpatentable over Ovesjo in view of Hiramatsu and further in view of U.S. Patent No. 6,381,229 to Narvinger et al. ("Narvinger"). The Examiner objected to claims 87, 89-91, 103-105, 107-109, 115, 116, 122-124, 130-132 and 134-137 as being dependent on a rejected base claim, but stated that claims 87, 89-91, 103-105, 107-109, 115, 116, 122-124, 130-132 and 134-137 would be allowable if rewritten in independent form to include the limitations of the base claim and any intervening claims.

Ovesjo discloses channelization code allocation for radio communication systems so that the control channel is orthogonal to all physical channels in the composite spread spectrum signal. Hiramatsu discloses a transmitting/receiving apparatus using a plurality of spreading codes.

The transmitting/receiving apparatus installed in the base station designates the kind and number of spreading codes used in a reverse link to the mobile station through a forward link at the time that communication with the mobile station started. The transmitting/receiving apparatus installed in the mobile station transmits a signal to the base station by using spreading codes of the kind and number designated by the base station.

In contrast to the prior art, the present invention discloses a QPSK modulator modulating a data message based on spreading codes. The spreading codes are selected so that the two consecutive pairs of the I and Q data are correspondent to two points located on the same point or symmetrical with respect to a zero point (origin) on a phase domain, to thereby reduce a peak-to-average power ratio (PAPR) in a mobile communication system.

Ovesjo does not disclose or suggest selection of the spreading codes such that the two consecutive pairs of the I and Q data are correspondent to two points located on the same point or symmetrical with respect to a zero point (origin) on a phase domain. Instead, in Ovesjo the spreading codes are assigned so that the control channel is orthogonal to all physical channels in the composite spread spectrum signal.

As now more definitively set forth in amended claims 83, 113, and 117, the present invention is neither taught nor suggested by Ovesjo, whether alone or in combination with Hiramatsu and/or Narvinger. For at least the foregoing reasons, claims 83, 113 and 117, as well as new claims 141-145 are patentable over the prior art. Claims 86-97, 99, 101-109, 111, 112, 114-116, 119-124, 126, 128-136 and 138-140 are also in condition for allowance as claims properly dependent on an allowable base claim.

New claim 146 represents the combined subject matter of original claims 83, 84, 85, 86 and 87 and is therefore in condition for allowance in accordance with the Examiner's identification of allowable subject matter in claim 87.

New claim 147 represents the combined subject matter of original claims 83, 84, 85, 86, 102 and 103 and is therefore in condition for allowance in accordance with the Examiner's identification of allowable subject matter in claim 103.

New claim 148 represents the combined subject matter of original claims 83, 106 and 107 and is therefore in condition for allowance in accordance with the Examiner's identification of allowable subject matter in claim 107.

New claim 149 represents the combined subject matter of original claims 113, 114, and 115 and is therefore in condition for allowance in accordance with the Examiner's identification of allowable subject matter in claim 115.

New claim 150 represents the combined subject matter of original claims 117, 119, and 122 and is therefore in condition for allowance in accordance with the Examiner's identification of allowable subject matter in claim 122.

New claim 151 represents the combined subject matter of original claims 117, 133 and 134 and is therefore in condition for allowance in accordance with the Examiner's identification of allowable subject matter in claim 134.

With the foregoing amendments and remarks, the application is in condition for allowance in accordance with the Examiner's identification of allowable subject matter. Should the Examiner have any questions or comments, the Examiner is cordially invited to telephone the undersigned attorney so that the present application can receive an early Notice of Allowance.

Respectfully submitted,

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